



103-005-CIP

TITLE

Methods of Synthesis of Polysuccinimide, Copolymers of Polysuccinimide and

5 Derivatives thereof

This application is a Continuation-In-Part of Applications Ser. No. 10/307,349 and 10/307,387, both filed December 2, 2002, which are a Continuation and Continuation-In-Part, respectively, of Application Ser. No. 09/776,897, filed February 6, 2001, now US
10 Patent No. 6,495,658, issued December 17, 2002, all three of which are incorporated herein by reference in their entirety.

BACKGROUND OF THE INVENTION

Field of the Invention

15 The present invention relates to a process for the preparation of polysuccinimide, polysuccinimide copolymers and derivatives thereof.

Discussion of the Related Art

L-Aspartic acid has been produced commercially since the 1980's via
20 immobilized enzyme methods. The L-aspartic acid so produced mainly has been used as a component of the synthetic sweetener, N-aspartylphenylalaninemethyl ester (ASPARTAME®).

In a typical production pathway, a solution of ammonium maleate is converted to fumarate via action of an immobilized enzyme, maleate isomerase, by continuous flow
25 over an immobilized enzyme bed. Next, the solution of ammonium fumarate is treated with ammonia also by continuous flow of the solution over a bed of the immobilized enzyme, aspartase. A relatively concentrated solution of ammonium aspartate is produced, which then is treated with an acid, for example nitric acid, to precipitate L-aspartic acid. After drying, the resultant product of the process is powdered or crystalline
30 L-aspartic acid. Prior art that exemplifies this production pathway includes US Patent